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ABSTRACT

This guide is intended to help bridge the gap between the goal of fitting individuals for gainful and satisfying employment and the realities of the labor market which must provide that employment. It provides occupational program planners with simple suggestions on how to incorporate pertinent information into the planning process at minimal cost using data resources from the Hawaii Occupational Employment Planning System (HOEPS). The eight steps in the Occupational Program Planning Process for HOEPS are outlined together with the resources needed and the product of each step. A diagram of the HOEPS Program Planning Structure is then provided, followed by a guide to occupational program planning using the HOEPS. Four steps are described: creation of a list of occupations, refinement of the occupational list, analysis of occupational program need, and program design. The eight tasks are grouped under the four steps and are also described. Appendixes, amounting to over one-half of the guide, include (1) two chapters from the National Occupational Information Coordinating Committee's "OIS Handbook, Volume 2: Occupational Information Analysis" on quantitative analysis--issues and procedures and qualitative analysis--interpretation and explanation; (2) information on how to use the microcomputer delivery system MICRO-OIS/CIDS in the occupational planning process; and (3) tables. (YLB)

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A GUIDE TO OCCUPATIONAL PROGRAM PLANNING

HOEPS

HAWAII OCCUPATIONAL EMPLOYMENT PLANNING SYSTEM

U.S. DEPARTMENT OF EDUCATION
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April 1985

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April 1985

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HAWAII STATE OCCUPATIONAL INFORMATION COORDINATING COMMITTEE

A GUIDE TO OCCUPATIONAL PROGRAM PLANNING USING HOEPS

Table of Contents

	Page
INTRODUCTION	1
THE OCCUPATIONAL PLANNING PROCESS FOR HOEPS	2
HOEPS OCCUPATIONAL PROGRAM PLANNING STRUCTURE	3
STEP ONE: CREATE A LIST OF OCCUPATIONS	4
Task 1: Gathering Ideas for Potential Programs by Assessing the Needs and Interests in the Community	4
Task 2: Data for Potential Programs by Reviewing Employment Trends	5
Task 3: Translating the Planning List into Occupational Titles	7
STEP TWO: REFINE THE OCCUPATIONAL LIST	9
Task 4: Reducing the Planning List to the Most Appropriate Occupations	9
STEP THREE: ANALYSIS OF OCCUPATIONAL PROGRAM NEED	11
Task 5: Reviewing Available Occupational and Labor Market Information	11
Task 6: Assess Status of Current Available Training Programs	12
Task 7: Review Findings with Employer Advisory Committee	12
STEP FOUR: PROGRAM DESIGN	13
Task 8: Design Program	13

APPENDIX

NOICC OIS HANDBOOK: QUANTITATIVE ANALYSIS
--Issues and Procedures
--Interpretation and Explanation

HOW TO USE MICRO-OIS/CIDS IN THE OCCUPATIONAL PLANNING PROCESS

TABLES

1: Community Sources
2: Units of Analysis
3: Demand Report
4: Characteristics Report and Definitions
5: Aggregate Rank Order
6: Analysis Report
7: Supply Report

Introduction

As the emphasis on meeting labor demand grows and as employment training and vocational education budgets shrink, it will become even more important for planners to take full advantage of existing occupational information and learn to develop additional information resources for local use. This guide is intended to help bridge the gap between the goal fitting individuals for gainful and satisfying employment and the realities of the labor market which must provide that employment. The guide provides occupational program planners with simple suggestions on how to incorporate pertinent information into the planning process at minimal cost using data resources from the Hawaii Occupational Employment Planning System (HOEPS). Each of the files in HOEPS's micro-computer delivery system (Micro-OIS) becomes a key element of the process.

While the guide does not attempt to deal with all the complexities of economic analysis, it does provide the user with essential tools and methods of labor market and occupational analysis.

The HOEPS relies heavily on many data donors. We wish to thank the Office of Research and Statistics, Department of Labor and Industrial Relations, for its continuing support in providing labor market information, especially occupational projections. Also, the educational systems, especially the Department of Education Office of Instructional Services and University of Hawaii Community College System and Hilo Community College for providing enrollment and completion data, and to the private training institutions for their data.

Acknowledgment also goes to the National Occupational Information Coordinating Committee for providing the technical assistance and grant funds to develop and implement Micro-OIS for HOEPS. And to the Western Occupational Research Corporation of Boulder, Colorado, for its continued professional response in implementing Micro-OIS.

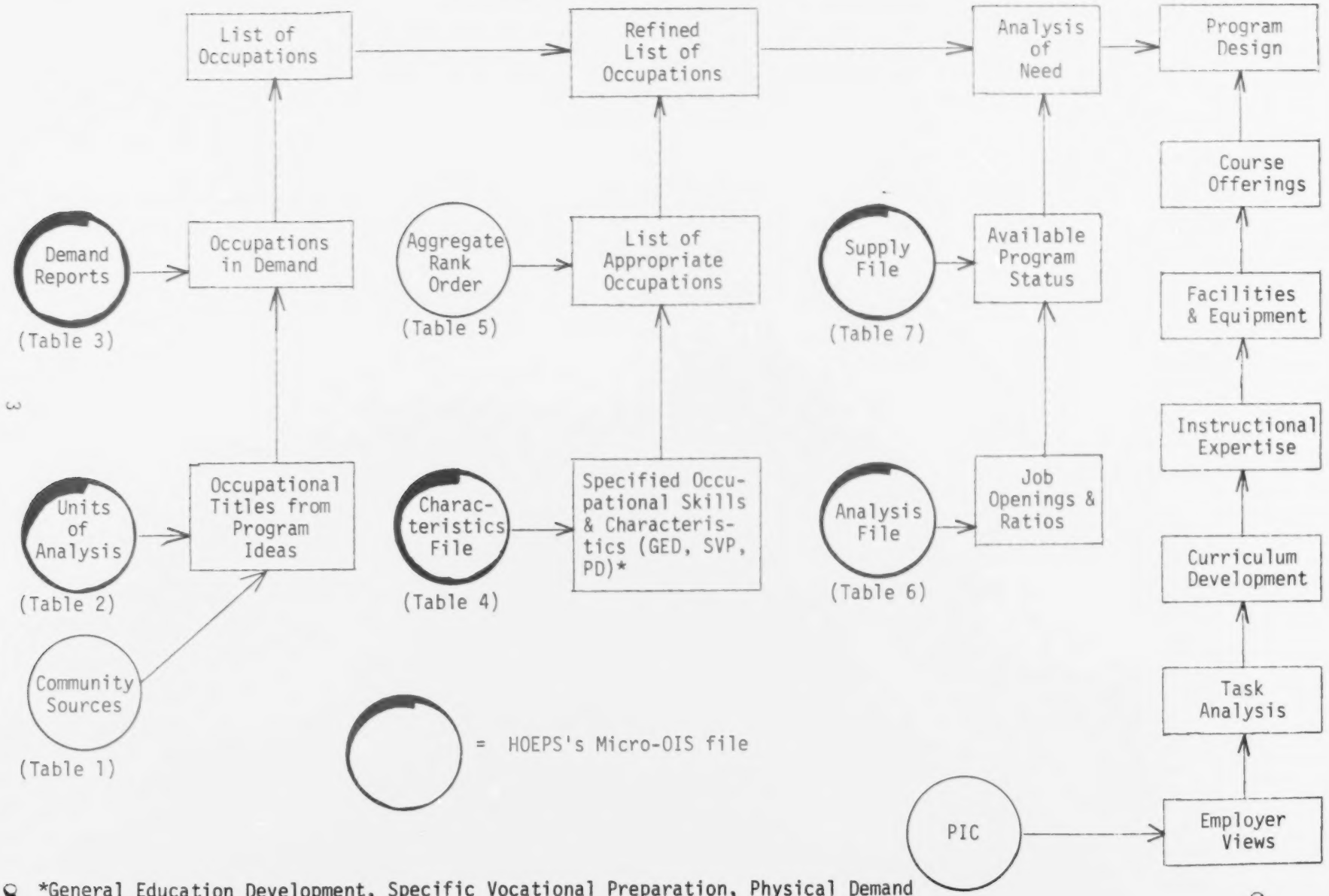
This guide was adapted from the California OICC Guide for Local Planners, December, 1982.

Appendix material is from NOICC's OIS Handbook, Volume 2: Occupational Information Analysis.

THE OCCUPATIONAL PROGRAM PLANNING PROCESS FOR HOEPS

Task	Resource	Product
1. Define community interests in terms of training program areas.	A. HOEPS units of analysis	1. Occupational list based on program ideas
2. Identify occupations in demand by SOC/DOT title.	B. HOEPS Demand Reports	1. List of occupations in demand
3. Assign specific occupational skills and characteristics to list.	C. HOEPS Characteristics Report	1. Occupational list described by GED, SVP, PD & tasks
4. Rank order list of occupations by size, growth rate and average annual openings plus characteristics; develop aggregate ranking.	D. OES cross tabs	1. Rank ordered occupational list
5. Review outlook, projections, job openings and ratio of claimants to openings.	E. HOEPS Analysis File	1. Indication of immediate and projected demand and competition in market place
6. Determine current available training program offerings and level of activity.	F. HOEPS Supply File	1. Inventory of current training activities and proxy measure of supply/demand conditions including completions & placements
7. Seek employer views based on overall analysis of occupational demand, skill requirements, & availability.	G. PICs, Review Panels, Advisory Committees, Surveys, etc.	1. Input to program design.
8. Design occupational training program based on above analysis of need taking into account: a) task analysis-based skills needed for average proficiency on the job, b) curriculum development, c) needed level of instructional expertise, d) facilities and equipment requirements, and e) level and spread of course offerings.	H. Handbook for Analyzing Jobs, DOT, OOH, etc. plus institutional expertise	1. Program design
	I. NOICC OIS Handbook	1. Caveats on quantitative analysis of occupational information

HOEPS OCCUPATIONAL PROGRAM PLANNING STRUCTURE



*General Education Development, Specific Vocational Preparation, Physical Demand

Step One: Create a List of Occupations

This step deals with creating a planning list of occupational titles from initial program ideas. The first two tasks describe the methods for obtaining ideas for new programs. If you are only interested in evaluating an existing program, proceed to the third task, TRANSLATING THE "PLANNING LIST" INTO OCCUPATIONAL TITLES.

In determining what new programs might be viable, the planner's initial task is to create a planning list of program ideas. Typically, ideas for new programs come from board members, potential instructors, placement staff, employers, counseling staff, advisory committees, and so on. This input is extremely valuable and should be encouraged as it represents the views and inside information of interested parties. However, other, more systematic methods of identifying program possibilities for further analysis should also be considered. A systematic approach will provide a comprehensive view of both the needs and interests as well as the growth industries and occupations in the community. Two types of information should be thought of as potential sources of program ideas:

- interests and needs of those in the community (students, service area population, and employers) and
- industry and occupational employment trends.

Task 1:
Gathering Ideas for Potential Programs by Assessing the Needs and Interests in the Community

The first portion of the planning list can be developed by assessing the needs and interests of members of the community. An interest or needs assessment will illuminate preferences and perceived needs--which, if one believes that the individual is his or her best spokesperson and advocate, may actually represent the optimal information for aligning an institution with the community's priorities. Assessment can be made through formal surveys and/or keeping track of informal suggestions or requests. Programs which address the community's interests and/or needs will generate program support in terms of steady assistance in curriculum development from employers, and contibutions of equipment and classroom facilities. In addition, a systematic assessment assures a more equitable provision of services. Additional demographic information can be obtained from the office of Research & Statistics, Department of Labor & Industrial Relations.

Task 2:
Data for Potential Programs by Reviewing Employment Trends

Ideas for the planning list can also be developed by keeping attuned to labor market developments. Concurrently with assessing community needs and keeping track of informal suggestions, planners should be reviewing employment trends--at the national and state levels as well as at the local level. Emerging technologies may be recognized nationally before they affect occupations on a local level. This advance warning will help keep planners alert to the changing needs in the economy. Planners should set aside time to become familiar with the content and organization of the following publications:

- Occupational Outlook Quarterly--highlights new occupations and training opportunities found throughout the nation. This is a good resource for keeping up with recent occupational developments.

- Annual Planning Information/Annual Newsletter--in addition to providing the demographic information described earlier, the API discusses industry trends and the occupational outlook. These are available for Hawaii as a whole, each SMSA, and each county.

- Employment Outlook for Industries and Occupations--identifies occupations that occur within particular industries and gives estimates of the numbers of jobs by occupation and industry for 1980 and 1990. The data in this publication can be used as indicators of growth trends, especially in occupations with large employment. This publication is available for Hawaii as a whole, and for many of the state's labor market areas.

- HOEPS Micro-OIS--files in this computer-based planning system are organized by units of analysis which relate common occupational outcomes to training program clusters; these units can be used to organize non-standard program proposals. The demand file has put the Emloyment Outlook data into a DBMS for ease of manipulation and analysis.

LIST JOB OPPORTUNITIES: using the demand report feature of Micro-OIS, make a list of occupations in descending order according to the number of Total Job Opportunities (third column of numbers).

LIST PERCENT CHANGE: using the same report, make a list of occupations (again, exclude the summary occupations) in descending order according to the size of Percent Change in Employment (fifth column of numbers).

LIST AVERAGE ANNUAL OPENINGS: using the same procedure as above, make a list of occupations in descending order according to Average Annual Openings.

RANK AND COMBINE LISTS: assign a score to each occupation in each list according to rank. Locate each occupation on both lists; add together the scores for each occupation. Create a third list, ranked by the combined score of each occupation. The lowest combined score should be first; the highest combined score last.

For example, Cooks, Exc. Private ranked 7th on the Job Opportunities list (Example 1) and ranked 13th on the Percent Change list (Example 2). Adding the two ranks together results in a combined score of 20. That gives Cooks, Exc. Private the lowest combined score which means it ranks first on the "combined" list.

EXAMINE LISTS: examine all three lists. The occupations at the top of each of these lists are those which have the greatest number of job opportunities, those which have the fastest growth rate, and those which have the best combination. The top occupations from each list warrant further investigation.

The list of greatest importance to most planners is the Job Opportunities list. Programs are typically for occupations which have high employment. The "combined" list will show the high employment occupations which are also growing rapidly. Therefore, these two lists should be most closely examined.

CHOOSE OCCUPATIONS FOR PLANNING LIST : the decision as to how many occupations should be added to the "planning list" is a matter of judgment. Planners may wish to take the top 10 or 15 from the Job Opportunities and "combined" lists, or they may wish to scan several ranks of both lists for occupations which seem most feasible for their training institutions.

At this point, the planner has a planning list of ideas which reflect the interests of the community and employment trends. It is here that existing programs which are to be evaluated should be added to the planning list. The next activity translates the ideas on the planning list into specific occupations which are related to those ideas.

Task 3:
Translating the Planning List into Occupational Titles

This task describes how to convert the planning list into occupational titles to assure consistency and comprehension when gathering information.

After identifying interest and needs in the community and projected occupational trends, planners will have a number of new program ideas to explore, as well as existing programs to evaluate. This planning list, therefore, will be made up of three types of ideas: 1) occupational categories from the Employment Outlook, 2) existing programs to be evaluated, and 3) program ideas, based on an assessment of community interests, and a general review of employment trends. In order to proceed with the next step of the analysis, planners must accomplish two things. First, they must break down the planning list into a comparable level of occupational definition. Second, they must establish which occupations (or more specifically, which skills, knowledge, and aptitutdes) will define the potential program. The benefits to planners are a common understanding of the occupational focus of the programs being considered and easier use of available labor market information.

The following process provides a method for grouping planning list ideas, organizing them into an existing classification system, and expanding the planning list to all possibly related occupations. This assures that the planner will consider the demand for groups of related occupations, rather than only one occupation at a time. This is important because while the demand for one occupation might not warrant starting or continuing a program, the combined demand for several related occupations could indicate a viable program. Later, this list will be reduced to occupations most appropriate for a potential program based on occupational characteristics and employment opportunities. To accomplish this, the planning list must be translated into specific standardized occupational titles and definitions.

- Selected Characteristics of Occupations in the DOT --assigns general education development, specific vocational preparation, physical demands and environmental conditions to each title in DOT.

- HOEPS Micro-OIS Characteristics File--this file takes the characteristics for GED, SVP, and PD from the above source and adds them to the DBMS of Micro-OIS to allow for added prioritization of the planning list by these variables.

GROUP SIMILAR IDEAS/SUGGESTIONS: loosely organize the planning list into like subject matter groups where possible. By identifying like groups for later analysis, the planner will be able to segment the work into manageable units and will have already begun the process of grouping occupations into programs.

USE A STANDARD CLASSIFICATION SYSTEM: in order to obtain lists of DOT occupations from the subject matter groups, Micro-OIS uses a SOC/DOT classification system which has been directly or indirectly related to other coding systems. These include:

- Standard Terminology for Curriculum and Instruction in Local and State School Systems--Handbook VI (USOE)
- Guide for Occupational Exploration (GOE)
- Standard Occupational Classification Manual (SOC)
- Census Occupational Classification System
- Classification of Instructional Programs (CIP)
- Occupational Employment Statistics classification system (OES)

LINK GROUPS TO RELATED CATEGORIES: taking one subject matter group at a time, link "planning list" ideas to all possibly relevant categories in the classification system chosen. Carefully review all of the categories, as related areas are not always evident.

IDENTIFY DOT OCCUPATIONS: once pertinent cateogires have been identified, translate these categories to specific DOT occupations. This can be accomplished directly (some classification systems are actually groupings of DOT occupations, e.g., GOE, SOC) or indirectly (some classification systems have been related to the DOT by means of a cross-reference system or "crosswalk," e.g., CIP, USOE, OES, Census).

The planner will notice that the process described above can result in very long lists of occupations to consider. The more specific the original suggestions were, the less of a problem this will be. In any case, the result will be a reasonably comprehensive listing of DOT occupations which may be related to the initial program ideas. The steps which follow will refine the planning list to the occupations most appropriate to the training institution.

Step Two: Refine the Occupational List

The first task of this step describes methods which refine the planning list to those occupations which warrant labor market assessment. The second task discusses grouping occupations into potential programs based on similarity of skills, knowledge, and aptitudes required for the occupations.

Task 4:
Reducing the Planning List to the Most Appropriate Occupations

The next activity in the analytical process is to reduce the planning list to a manageable size and refine the list to those occupations which are appropriate for the individual training institution. The following process centers on how to eliminate occupations based on employment size, training time, and math and language skills required. Each criterion can be used to reduce and refine the planning list and, hence, reduce the amount of detailed labor market assessment. The following steps describe how to use the criteria available to reduce the list and verify the appropriateness of the occupations to the institution's training guidelines. These resources can help at this point in the process:

- Ranking Reports of Occupational Employment Projections --the Research and Statistics Office of the DLIR can provide rank order listings by each field from their projections reports; rank by current employment, projected employment or average openings are possible.

- HOEPS Micro-OIS Demand File--current and projected employment for specific occupational titles are related to training programs.

- HOEPS Micro-OIS Supply File--latest enrollment/completion data related to occupational titles in the Demand File.

- HOEPS Micro-OIS Analysis File--wages for occupations as well as data on latest job openings and applicants and UI claimants.

- HOEPS Micro-OIS Characteristics File--these traits can help identify occupations for special training needs such as amount of training needed, physical demands related to occupational training, attainment level, temperaments, and environmental conditions.

REDUCE LIST BY EMPLOYMENT SIZE: Look up categories identified in the step, LINK GROUPS TO RELATED CATEGORIES in the appropriate Guide Supplement. The listing of occupations you find will be limited to only those fourth edition DOT occupations which have been projected to have 1,000 or more individuals employed in Hawaii in 1985. This level of employment was selected only to limit the over 12,000 occupations defined in the DOT to those most commonly employed in Hawaii and, therefore, most likely to be relevant to vocational education and employment training providers.

REDUCE LIST BY OCCUPATIONAL CHARACTERISTICS: using HOEPS's Micro-OIS Characteristics File, assess the characteristics of the occupations in light of your institution's training objectives. The file lists the extent of mathematical development, language development, specific vocational preparation, and physical demand necessary to perform the duties of each occupation. The juxtaposition of this information to the reduced DOT listing will allow you to refine the list of potential occupations further by eliminating those occupations requiring either:

- greater mathematical or language skills than their potential student population normally possesses, or
- more time in specific vocational preparation than allowed by the training institution's guidelines.
- physical demands that can not be job-engineered or in any other way made conducive to the needs of individuals or program requirements.

The final step in the refinement process is to break the reaming occupations down to essential skills, knowledge, and aptitudes. This process will provide information that will help determine the ultimate appropriateness of each occupation to a program grouping and to the training institution. The resources available to adi in this process include the occupational definitions and characteristics described in the Dictionary of Occupational Titles and the Occupational Outlook Handbook as well as the Characteristics File and the Occupational File of Career Kokua, HCIDS.

These three sources provide information regarding:

- worker actions, nature of the work performed;
- machines, tools, equipment, or materials used;
- products made, subject matter dealt with, or services rendered;
- working conditions;
- earning potential;
- training or licensure required.

Planners can recognize similarities between occupations, as well as eliminate inappropriate occupations on the basis of this information. Once extraneous occupations are eliminated, the remaining occupations can be clustered into preliminary program groupings.

What remains at this point are groups of occupations which are specifically defined, closely related to each other, and appropriate to the institution's objectives. Now the planner can begin to effectively evaluate the labor market opportunities for these groups.

Step Three: Analysis of Occupational Program Need

This step describes the resources and methods necessary to assess the labor market potential of the occupational groupings developed in Step Two.

Task 5:
Reviewing Available Occupational and Labor Market Information

This Guide presents a method which does not depend on a strict numerical comparison of supply data to demand data. It is, however, an effective means of exploring labor market opportunities for graduates of programs being considered. It is also currently the most feasible method considering limitations in available data and complexities involved in the entire process of labor market analysis.

The process described below applies effectively to both the assessment of new program possibilities and the evaluation of existing program offerings. It assesses indications of growth trends in demand from a variety of sources: labor market publications, placement success of similar programs, job openings, the local labor market analyst, and local employer input. This information will help program administrators make more informed decisions.

In preparing to being the analysis, it may be helpful for the planner to develop a file on each group of occupations. The planner will want to analyze one group at a time to facilitate the analysis process. The information from these files will provide the basis of presentations to an employer advisory committee. Throughout the analysis process, the planner should maintain an objective perspective on the information by continuously comparing local trends with state and national trends. At this point the planner will also need to determine the appropriate labor market area for future program graduates in order to decide which local information to include in the assessment. As stated in the Introduction, the planner should start with information for the officially defined labor market area and modify it as necessary.

CHECK SOC/DOT-BASED INFORMATION: check for job outlook information in available publications which provide SOC/DOT-based information. These include the Occupational Outlook Handbook, Annual Planning Information and the HOEPS's Micro-OIS Analysis File and Supply File.

CHECK EMPLOYMENT OUTLOOK REPORTS: using the Employment Outlook, locate the related occupational categories in the local and statewide reports. This report references OES occupations to projections-report line numbers. While the related category in the projections report will be composed of more than one DOT occupation, the data on employment growth and opportunities can be used as indicators of future occupational trends.

CHECK JOB OPENINGS: You may also want to contact a local Employment Service and private job placement office and review classified ads in newspapers to ascertain the number and frequency of job openings in the pertinent occupations.

Task 6:
Assess Status of Current Available Training Programs

HOEPS Micro-OIS Supply File: this file shows what vocational-technical training programs exist and the level of their activity by enrollment or completion size, but no narrative description of the programs is given.

Career Kokua Programs of Study File: a complete listing describes vocational-technical and all other training programs available in Hawaii by County; schools offering the programs are also given.

CHECK SIMILAR PROGRAMS OFFERED: In addition to using the HOEPS Micro-OIS Supply File and the Career Kokua Description and Programs of Study files, you may also want to call training institutions offering similar programs to determine the average number of individuals completing the program, their placement success, and specific skills acquired by completers. You can use the specific DOT descriptions to assure comparability of training when assessing the information gathered.

When evaluating an existing program, you can use information on the placement rate of your own program completers as an indication of the demand for the skills being taught as well as the quality of the program.

Task 7:
Review Findings with Employer Advisory Committee

In order to assure that the labor market analysis process has been thorough and that reasonable conclusions have been reached, an occupationally-specific employer advisory committee should be established. The committee will not only review the information developed during the analysis, but also recommend which skills should be emphasized in program design and make suggestions on how to achieve success in placing graduates.

The work that was done during the labor market analysis will allow planners to begin soliciting members for the committee during the employer survey. An advisory committee should be a group of individuals willing to make a commitment to the institution by regularly attending advisory meetings and being available for specific assistance when needed. If possible, they should represent the range of industries which employ the relevant occupations.

Information should be presented to the committee in a concise yet complete manner. This will allow meetings to be structured to obtain precisely the feedback necessary in a short time, which is crucial to the productive use of the meeting time. Specific information which the planner will want reviewed includes:

- DOT descriptions for occupations to be related to the program,
- skills, knowledge, and aptitudes necessary for the jobs, and
- indications of labor market opportunities.

As in the employer survey, the planner should carefully note differences between information gathered earlier and that provided by the employer advisory committee. Those differences should be discussed by the committee and, if possible, resolved at this point.

Step Four: Program Design

The design of a new program, as well as the modification of ongoing programs, can benefit from the information gathered during the analysis process. The labor market information of particular interest to the planner is that which encompasses employer requirements for the skills, knowledge and aptitudes (SKA) required of entry-level workers. Many sources of LMI are available for describing the SKA related to job content. The descriptive material provided by publications such as the DOT, Occupational Outlook Handbook, and Occupational Guides, can provide the framework for curriculum development and discussions with employers. This information is also used in determining course content, facilities needed, state-of-the-art requirements, and expertise needed by the instructor. Since job content is dynamic, published descriptions may become outdated. Consequently, employer input gathered by participation on employer advisory committees or review panels is vital.

Task 8:
Design Program

In the situation where published descriptions differ significantly from the information gathered from employer advisory committees or review panels, the planner may need to perform a task analysis before designing programs. This analysis requires detailed observation of workers performing the job or detailed discussion with someone familiar with the job, the methods and equipment used, the materials or services produced, and the traits required. The specific tasks associated with a given job or group of jobs can clarify a specific program design in terms of the course content. In other words, are the specific tasks complex enough to justify multiple courses, or can the program be limited to one course? These questions are judgmental and the program design may in fact cary from one school to another.

Detailed task analysis instructions are available in the US DOL publication Handbook for Analyzing Jobs.

APPENDIX

QUANTITATIVE ANALYSIS

--Issues and Procedures

--Interpretation and Explanation

HOW TO USE MICRO-OIS/CIDS IN THE OCCUPATIONAL PLANNING PROCESS

TABLES

1: COMMUNITY SOURCES

2: UNITS OF ANALYSIS

3: DEMAND REPORT

4: CHARACTERISTICS REPORT AND DEFINITIONS

5: AGGREGATE RANK ORDER

6: ANALYSIS REPORT

7: SUPPLY REPORT

INTRODUCTION

The purpose of this chapter is to provide a detailed discussion of the procedures that can be used to address the issues and problems involved in supply/demand analysis. These problems occur in the process of designing and developing a supply/demand product that has the following features:

- The product integrates data from a variety of programs and data sources
- The product reconciles user needs and preferences for occupational information with available data sources

The resolution of these problems is covered in the OIS Development Process in the following steps:

- Step 3--Determine what OIS supply/demand products will be developed or improved.
- Step 4--Determine what sources of information will be used for the development of supply/demand information for proposed products.
- Step 5--Determine the specifications of the supply/demand products that will be developed.
- Step 6--Determine what procedures must be dealt with to develop a specific supply/demand product.
- Step 7--Develop quantitative supply/demand information for supply/demand products.

Chapter 3 discussed these steps in detail and cross-referenced each step to specific sections in Chapter 4. This chapter is subdivided into the four issue sections. Each section is presented in a standard format that covers the problems associated with each data subcomponent, alternative solutions for each problem, and procedural steps for each alternative solution. The four issue areas are briefly reviewed below:

- Classification Issues (Section 4.1)--Data from available sources of information are collected and tabulated using various classification systems. Some of these classification systems are for industries, some for occupations, and some for educational programs or disciplines. Given the different classification systems that are used to summarize detailed data, how can information from the different available data

sources be interrelated? Stated differently, how should classification system differences be resolved for occupational supply/demand analysis?

- Geographic Area Issues (Section 4.2)--Available sources of information represent different geographic areas in terms of coverage. These varying area coverages present difficulties in attempting to integrate information for an occupational supply/demand product. Since different geographic areas are represented for each data source and different aggregations or disaggregations of information may be possible, for what geographic areas should occupational supply/demand information be developed? What kinds of problems arise in attempting to integrate information from data sources that represent different and sometimes overlapping geographic areas?

- Time Period Issues (Section 4.3)--Available sources of information (1) cover different time periods, (2) are generated with varying frequency, and (3) have differing time delays between the actual collection and reporting of information and the availability of that information for acquisition. Given these various constraints in the time period coverage and the frequency of and/or delays in information availability, for what time periods should supply/demand information be developed? In many instances this time period analysis is determined by the timing constraints associated with acquiring information from data producers.

- Measurement Issues (Section 4.4)--An additional set of data issues to be dealt with in the quantitative aspect of supply/demand analysis are those that focus on: (1) the conceptual measurement of occupational demand and occupational supply, (2) the extent to which various data sources cover the universe of the occupational supply and demand data components, including possible gaps, and (3) the existence of possible duplication in coverage among different data sources.

A detailed discussion of each issue and related problems and solutions is presented within each section. A standard structure is used in the discussion of each issue. This structure is graphically displayed in Exhibit 4-1 and described on the page following the exhibit.

5 QUALITATIVE ANALYSIS— INTERPRETATION AND EXPLANATION

INTRODUCTION

Chapter 3 of this volume introduced an 11-step OIS Product Development Process. Chapter 4 described in detail the first seven steps in this process, ranging from identifying user needs to the development of quantitative supply/demand information for selected supply/demand products.

The occupational supply and demand information developed through step 8 has the following features:

- Common units of analysis
- Comparable geographic area coverage
- Comparable time period coverage
- No interpretation or analysis in either numerical or narrative forms
- Representative of a variety of programs and data sources
- Presentation limited to a tabular display of data

This chapter will describe two additional steps in this process, specifically:

- Step 9--Provide an initial explanation of what the quantitative supply/demand information means.
- Step 10--Analyze and interpret the quantitative supply/demand information through qualitative analysis.

It is necessary to recognize that the interpretation, analysis, and explanation of supply/demand information must be added to the presentation of data in tabular display; otherwise, inappropriate conclusions may be drawn from the quantitative data. The OIS product model introduced in Chapter 1 includes narrative, interpretation, and analysis as integral parts of the supply/demand product.

The purpose of this chapter is to discuss methods and techniques of interpreting and explaining occupational supply/demand data. The discussion is organized into the following sections:

- Initial explanation of the quantitative supply/demand information (Section 5.1)
- Occupational characteristics that identify the relevance of education and training programs to occupational entry (Section 5.2)
- Occupational characteristics that can be used to interpret or qualify the supply/demand relationships (Section 5.3)
- Proxy indicators of occupational supply/demand relationships (Section 5.4)

It should be noted that this chapter does not discuss all of the occupational characteristics described in Volume I of the OIS Handbook. Two types of characteristics information are not included here: those describing the nature of the occupation (definition and duties) and personal requirements (interests, temperaments, aptitudes, physical demands, and capabilities). The characteristics presented in this chapter are those that can be most directly used in supply/demand analysis.

The discussion of the occupational characteristics and proxy indicators in this chapter focuses on their use and application to interpret and analyze supply/demand relationships. It should be noted that the data sources for occupational characteristics and proxy information have limitations in coverage similar to occupational supply and demand data. The coverage of these sources are presented in tabular form in the last section of this chapter (Section 5.5).

5.1 INITIAL EXPLANATION OF THE QUANTITATIVE SUPPLY/DEMAND INFORMATION

The result of the OIS product development steps to this point is the production of one or more tables that display supply and demand data for a specified unit of analysis from different data/program sources. Given the difficulty in assessing a large amount of data at one time, it is helpful to convert the numbers to indices, ratios, or language that permit comparison and ranking of the data. The data comparison may be either within or between units of analysis. These two options are described below:

Comparison of the supply/demand data within a given unit of analysis--This analysis involves comparing the relative size of the demand and supply numbers for the specified unit of analysis. This comparison may be described in words (e.g., balance, surplus) or the ratios of the supply/demand number. Several examples of intra-occupational comparison are listed below:

- Example 1--Outlook description in the Occupational Outlook Handbook. For those occupations with information on the available supply of workers, the prospective supply/demand relationship is assessed and then translated into descriptions of "job opportunities" within each occupational narrative. The steps listed below describe the basis of comparison within an occupation.[1]

  (1) Compare occupational data on demand to supply (available training data)

  (2) Identify which of the following relationships is found in the first steps

      (a) Demand much greater than supply
      (b) Demand greater than supply
      (c) Rough balance between demand and supply
      (d) Likelihood of more supply than demand
      (e) Supply greater than demand

  (3) Describe the job opportunities for the occupation with one of the following statements:

      if 2a) Excellent
      if 2b) Very good
      if 2c) Good or favorable
      if 2d) May face competition
      if 2e) Keen competition

- Example 2--The Oregon Employment Division publishes occupational employment trends that indicate if the occupational unit of analysis appears to be:

  .. Surplus--supply exceeds demand
  .. Shortage--demand exceeds supply
  .. Balance--supply near demand

[1] Occupational Outlook Handbook, (U.S. Department of Labor, Bureau of Labor Statistics 1980), p. 5.

In describing the use of this information, the Oregon Employment Division provides this caveat:

> "All of the demand-supply conclusions reached in this publication are tentative given the limitations of the data and this should be used in conjunction with other information when trying to establish job related training programs."[2]

Comparison of the supply/demand data across different units of analysis--This type of analysis involves assessing the relative size of the supply/demand number across different units of analysis (occupations, programs, or clusters). The analysis may focus on the data items within the demand component, supply component, or the supply/demand component. The comparison may be based on the relative size of either the individual data items or the ratio of data items. Several examples of interoccupational comparison are listed below:

- Example 1--The Occupational Outlook Handbook's description of employment outlook for an occupation begins with a sentence about the expected change in employment through the 1980s. This description is based on a comparison of the occupation's projected change in employment requirements over the time period to the average increase projected for all occupations. The descriptions used relate to the following demand data:[3]

Description	Demand Data (Projected 1978-90 change in employment requirements)
Much faster than the average for all occupations	50.0 percent or more
Faster than the average for all occupations	25.0 to 49.9 percent
About as fast as the average for all occupations	15,0 to 24.9 percent

[2]Occupational Employment Trends in the Portland Metropolitan Area, 1977-1985 (State of Oregon, Department of Human Resources, Employment Division 1979), p. 29.

[3]Occupational Outlook Handbook, Op Cit

Description	Demand Data (Projected 1978-90 change in employment requirements)
More slowly than the average for all occupations	5.0 to 14.9 percent
Little change is expected	4.9 to -4.9 percent
Expected to decline	-5.0 percent or more

- Example 2--Comparisons can be made across occupations or units of analysis. Descriptions of two such comparisons are presented below:

  .. A number of States may publish data that display occupational titles in rank order by the relative size of their employment, annual job openings, or rate of growth.

  .. States may publish a ranking of either the ratios of the supply/demand relationship or the "net difference" between supply and demand. State Plans for Vocational Education often have a net difference column in their supply/demand tables. A rank order listing of programs by this column may be helpful in explaining such a table.

5.2 OCCUPATIONAL CHARACTERISTICS--RELEVANCE OF EDUCATION/TRAINING PROGRAMS TO OCCUPATIONAL ENTRY

Section 5.1 described several methods to compare and describe the "hard" numbers produced by integrating occupational supply/demand data. This section considers some "soft" measures that can be used to interpret the supply/demand data. The measures used are based on several occupational characteristics.

Occupational characteristics are defined as job-related trait information about the worker and work performed in an occupation. As presented in Chapter 4 of Volume 1 of the OIS Handbook, there are eight major topics and 26 specific items included in occupational characteristics. Several of these occupational characteristics are used in this section to identify the relevance of training programs to occupational

entry. It should be noted that this discussion of the individual characteristics treats them as independent measures, even though some characteristics, such as wages or job stability, may fluctuate with changes in the occupational supply and demand relationships. The characteristics are described as they independently affect supply/demand relationships.

The occupational characteristics that identify the relevance of training programs to occupational entry are listed below, with a notation of the Volume 2 sub-section in which they are described and the Volume 1 section that identifies major data sources.

Section	Characteristic	Volume 1 Description	Volume 2 Page Numbers
5.2.1	Degree of Unionization	4.8.5	5-6
5.2.2	Occupational Demographics	4.8.1	5-7
5.2.3	Entry Level Positions (Methods of Entry)	4.6.2	5-7
5.2.4	Industrial Concentration	4.8.4	5-7
5.2.5	Licensing Certification and Registration Requirements	4.5	5-8
5.2.6	Education and Training Requirements (SVP/GED)	4.4	5-8

These six characteristics are described below. The importance of these factors is to help qualify the supply/demand relationships. Specifically, these factors may provide qualitative evidence about the appropriateness and relevance of education and training programs for entering particular occupations. These characteristics should be understood and considered by planners prior to analyzing occupational supply/demand data.

5.2.1 DEGREE OF UNIONIZATION

This characteristic is significant as it affects entry into an occupation. The degree of unionization in some occupations may affect the number of persons entering the occupation as well as the means of entering it. Union-sponsored apprenticeship programs may provide the only source of workers who can be hired for an occupation in a certain locale or industry. If this is the case, the supply/demand

is most pertinent to the education and training facilities which are engaged in apprenticeship programs, The requirement and procedures for entering occupations that are highly unionized should be known and considered in the presentation of supply/demand data for program planning purposes.

5.2.2 OCCUPATIONAL DEMOGRAPHICS

Data on the known race, sex, and age distribution of the workers employed in an occupation can be of value in program planning. Occupations that historically have had sex and race employment patterns may have nontraditional employment potential. The age distribution of the workers currently employed in an occupation, when compared with the distribution of the labor force, may indicate the level of experience of workers currently working in the occupation or which is required for entry.

5.2.3 ENTRY-LEVEL POSITIONS (METHODS OF ENTRY)

Entry-level positions are those jobs most often open to workers beginning in the occupation. They may be at the lowest or beginning level of a promotional line, or they may be in "dead-end" jobs where turnover is apt to be high. Most entry-level jobs are filled from outside the employing establishment and therefore present good potential for placements from training programs, where pre-entry training is necessary or helpful. Sources that can help indicate entry-level occupatons include Employment Service job orders (See Volume 1, Section 2.1.2) and the occupational placements of education and training program graduates (See Volume 1, Section 3.2.2).

5.2.4 INDUSTRIAL CONCENTRATION

Knowledge of the employment concentration of an occupation by industry is of value in supply/demand analysis. When an occupation is concentrated in a few industries, it may be possible to obtain information on occupational entry routes by making surveys of the hiring methods of firms in the industry. A major source for identifying the industrial concentration of occupational employment is the inverted Industry-Occupation Matrix described in Section 2.1.1 of Volume 1.

5.2.5 LICENSING, CERTIFICATION, AND REGISTRATION REQUIREMENTS

Most State or local laws require that the individual must obtain a license from a State agency in order to engage in certain specified occupations, professions, or trades. The individual is required to meet all of the following specifications:

- Graduation from an accredited or approved education/training program, or completion of a given amount of work experience in the specific job
- Acceptable performance on a qualifying examination
- Certain personal prerequisites, such as age, citizenship, and good moral character

The importance of each of these specifications is described below:

- Licensing standards provide specific and exact statements of education/training and/or work experience requirements of an occupation. If an OIS product is prepared for occupations related to a short-term or secondary vocational training program, licensed occupations requiring completion of a postsecondary program probably should not be included.
- Qualifying examinations affect the measurement of available supply. The number of persons passing the exam may be a better measure of occupational supply than the number of graduates from related programs.
- Age or other requirements may suggest appropriate training areas for programs serving specific populations.

See Volume 1, Section 4.5 for a description of information sources on licensing requirements.

5.2.6 EDUCATION AND TRAINING REQUIREMENTS (SVP/GED)

Education and training requirements are a significant factor in matching supply and demand information. Occupations that require completion of a two-year training program should not be matched with the graduates of short-term programs. For licensed occupations, the entry level may be determined by a

legal standard. For other occupations, the Specific Vocational Preparation (SVP) designation used in the DOT Master Data Set (See Volume 1, Section 4.9.1.E) provides a useful rating of training requirements.

The SVP includes the amount of time required to learn the techniques, acquire the information, and develop the capability needed for average performance in a specific job situation. SVP includes vocational education, apprenticeship training, in-plant training, on-the-job training, and essential experience in other jobs. The SVP rating scale follows:

LEVEL	TIME	Approximate Clock Hours
1	Short demonstration only	
2	Anything beyond short demonstration up to and including 30 days	-160
3.	More than 30 days up to and including three months	160-480
4	More than three months up to and including six month	480-960
5	More than six months up to and including one year	960-1920
6	More than one year up to and including two years	1920-3840
7	More than two years up to and including four years	3840-7680
8	More than four years up to and including 10 years	7680-19200
9	More than 10 years	19200+

The General Education Development (GED) is a companion rating to the SVP. It rates education of a general nature, not specific occupational preparation. The GED rating scale (6 = Highest, 1 = Lowest) is used in three divisions: reasoning development, mathematical development, and language development. See Volume 1, Section 4.4 for a more complete discussion of SVP and GED.

5.3 OCCUPATIONAL CHARACTERISTICS THAT CAN BE USED TO INTERPRET OR QUALIFY THE SUPPLY/DEMAND RELATIONSHIP

In this section four occupational characteristics are described. These characteristics can be measured independently of the supply/demand relationship. These can be used as separate measures to test, either reinforcing or countering, the outlook for occupational training based on supply/demand analysis. The characteristics are listed below with a reference to the Volume 1 section that presents the major data sources for each characteristic.

Section	Characteristic	Volume 1 Description	Volume 2 Page Numbers
5.3.1	Job Stability	4.8.2	5-10
5.3.2	Turnover/New Hires	4.8.3	5-11
5.3.3	National, State and Local Earnings	4.7.2	5-12
5.3.4	Working Conditions--Physical Environment	4.2.2	5-13

5.3.1 JOB STABILITY

Job stability in occupations may be affected by seasonal fluctuation (variations during the year) or by cyclical fluctuation (variations over a business cycle). Measurement of job stability is generally accomplished through research studies using economic models that analyze occupational employment trends over time. Job stability is best described using a relative scale. In general, the more stable the occupation, the more attractive it is for training programs. Listed below are three representative statements outlining different relative degrees of cyclical and seasonal job stability:

Relative Degree of Job Stability

- Cyclincal stability based on relative employment and unemployment during a business cycle
  - Highly stable--Employment in an occupation is relatively stable under both good and bad business conditions

- Moderately stable--Employment in an occupation fluctuates moderately under varying business conditions

- Unstable--Employment in an occupation fluctuates significantly under varying business conditions

. Seasonal stability based on realtive employment levels over the course of the year

- Highly stable--Employment in an occupation is relatively stable over the course of the year

- Moderately stable--Employment in an occupation fluctuates moderately over the course of the year

- Unstable--Employment in an occupation fluctuates significantly over the course of the year

5.3.2 TURNOVER/NEW HIRES

The turnover of labor within an industry probably produces many of the job openings available in an occupation. Turnover does not represent growth and replacement in the occupation, but rather the openings created by the normal dynamics of hiring, termination, transfers, layoffs, quits, and promotions. In a quantitative supply/demand analysis, based upon long-term demand projections, an occupation may show little or no growth or replacement demand, yet there may be many job orders and referrals resulting in hires at Employment Service offices. The measure of the amount of turnover in an occupation or industry may be very important in the supply/demand analysis of many vocational education and CETA programs. There will be cases where the supply of trained workers from vocational education and CETA programs will exceed the projected demand for the occupation, yet follow-up data on related placement and unemployment rates in that occupation will not indicate excess supply. In these cases, the labor turnover for the occupation and its predominant industries should be analyzed to better interpret the supply/demand relationship. A high turnover rate would indicate that the long-term demand figures do not fully represent the dynamic demand for that occupation. A certain amount of turnover can indicate a greater number of employment opportunities than indicated by projections of growth and replacement needs. A turnover rate may also be excessively high indicating that there may be factors which make the occupation undesirable

and thus not well-suited as an employment goal for a program participant seeking economic stability.

The primary sources of labor turnover information is the publications of the Labor Turnover Statistics (LTS) program. It should be noted that these data are available by industry only. The survey generates monthly rates of accessions/separations per 100 employed in manufacturing, mining, and communications. The statistics provide State-wide and some SMSA coverage.

The LTS data are published in the following documents:

- Employment and Earnings (monthly)
- LMI Newsletter (monthly)
- Labor Turnover in Manufacturing (monthly press release)
- Employment and Earnings, United States (annually)

Below the SMSA level, some States may have the Employer Information System or the Employment Service Potential System, which could provide very specific data on labor turnover by employer, including Standard Industrial Classification (SIC) code, at a sub-State level (ZIP Code or local ES office).

5.3.3 NATIONAL, STATE, AND LOCAL EARNINGS

Wages are a key factor in education and training program planning. A major focus of the training is to improve the economic condition of program participants. Wage information can be used to help qualify supply/demand relationships in several ways. High wages in occupations with current job vacancies may indicate good training potential or they may reflect limitations to and constraints on occupational entry that may limit the role of training programs. Generally, high wages positively affect the supply of workers available for work in an occupation and low wages have a negative impact.

The importance given to wage data in interpreting supply/demand data may vary by agency. Agencies that operate programs to increase client earnings potential or conduct training in areas with the greatest social benefits vis-a-vis program costs (i.e., benefit/cost ratios) may place a greater emphasis on wage data than agencies emphasizing immediate job placement. Wage and earnings data sources are described in Volume 1, Section 4.1.2.

5.3.4 WORKING CONDITIONS--PHYSICAL ENVIRONMENT

The physical environment of a job includes possible exposure to heat, cold, wet, noise, or various hazards, or atmospheric conditions. The existence of any of these factors may reduce the attractiveness of an occupation for individual entry or training program development. The DOT Master Data Set (See description in Section 4,2 of Volume 1) provides working condition ratings for more than 12,000 DOT occupational titles.

The specific working conditions rated include:

- Physical Working Environment
  - Inside--Worker spends 75 percent or more of time indoors
  - Outside--Worker spends 75 percent of time, or more, outside
  - Both--Inside and outside (in approximately equal amounts)
- Extreme cold with or without temperature changes
- Extreme heat with or without temperature changes
- Wet and/or humid
- Noise and/or vibration
- Hazards
  - Mechanical
  - Electrical
  - Burns
  - Explosives
  - Radiant energy
  - Toxic agents
  - Working in high places
- Atmospheric conditions
  - Fumes
  - Odors
  - Dusts
  - Mists
  - Gases
  - Poor ventilation

5.4 PROXY INDICATORS OF THE OCCUPATIONAL SUPPLY/DEMAND RELATIONSHIP

The quantitative analysis described in Section 5,1 is based on the relative size of the numbers available to measure supply and demand. The purpose of this section is to describe several factors that can be used as proxy indicators of the supply/demand relationship. It should be noted that proxy indicators should be used with some caution as the coverage of their data sources is often more limited than that of the major sources of supply and demand data (See Section 5.5). The proxies described are listed below.

To the right of each factor is the section in Volume 1 that provides a description of major data sources for that factor:

Section	Proxy	Volume 1 Description	Volume 2 Page Numbers
5.4.1	Historical Placement Data	3.2.2	5-15
5.4.2	Ratio of the Number of Job Orders to the Number of Applicants Over Time	2.1.2.A and 3.3.1.A	5-16
5.4.3	Hard-to-Fill Openings	2.1.2.A	5-17
5.4.4	Emerging Occupations	2.2.1	5-18
5.4.5	Industry Growth Patterns	2.2.1.A	5-19
5.4.6	Employment Service Potential and Employer Information System	5.2.3.B	5-20

These proxy factors, if based on adequate and valid data, can be used in the following ways:

- In the absence of other supply/demand data, proxies can be used as indicators of a supply/demand relationship and become part of the data base used in program planning and career counseling.
- In conjunction with supply/demand data, they can be used to verify, either reinforcing or contradicting, the supply/demand relationship.

- In conjunction with supply/demand data, they can be used to indicate relationships at a finer level than available supply/demand data:

  - Example One--Proxy data may be available for smaller geographic areas. They might be used to estimate local patterns given the area relationship set by supply/demand data.

  - Example Two--Proxy data may be available for finer levels of occupational detail than supply/demand data. It could be used to estimate the pattern of individual occupations within the context of a broader occupational supply/demand relationship.

5.4.1 HISTORICAL PLACEMENT DATA

Historical data on placements by occupation reported by education and training institutions or by the Employment Service provide a useful indicator of past supply/demand situations. Placement rates can be analyzed across occupational or instructional areas. Placement rates across occupational areas can be compared and ranked to identify the top/bottom five or ten areas for further analysis.

This process is similar to the quantitative analysis described in Section 5.1, except placement rates, not supply/demand data, provide the information base. Placement rates provide an immediate measure of job-related outcomes of training programs. The following limitations should be recognized in using placement data:

- Several different measures of placement may be available. Training-related job placement provides the most direct proxy for supply/demand relationships. Depending on the training program, job placement and educational placement data may also be available.

- Placement rates may be good proxies of supply/demand relationships as they represent multiple year and multiple agency data. Single-source, single-year placement data are usually of limited value because outcomes may be based on isolated economic conditions or unique guidance, training, or job placement features of the training agency.

The following relationships may be inferred from the placement rates of different education/training programs:

Relative Measure	Indicated Supply/Demand Relationship
High placement rate in occupation (by program and/or by training establishment)	. There is a high occupational demand for those job skills in the labor market and/or . There is a shortage of workers already trained or qualified for the occupations and/or . The completers of the program are superior in skill to other applicants and/or . Employers are actively recruiting program graduates
Medium placement rate	. Demand for workers is continuous but not strong and the total supply of available workers from all sources is adequate to meet ongoing needs
Low placement rate	. There may be insufficient jobs available in the labor market and/or . The program completers are not successfully competing for the available openings

5.4.2 RATIO OF THE NUMBER OF JOB ORDERS TO THE NUMBER OF JOB APPLICANTS OVER TIME

Trend data developed from counts of the number of job orders received and the number of applicants seeking work in an occupation over a given period of time may serve as a useful proxy for the supply/demand conditions in a given occupation in a labor market. Trend information may be developed over time from data available in the Employment Service Automated Reporting System (ESARS) reports. ESARS Table 96, Applicants and Nonagricultural Job Openings by Occupation, is a routinely published report that is, in effect, a mini-report on occupational supply/demand that reflects the transactions of

the State Employment Service. In the absence of more complete data, Table 96 can be used on a longitudinal basis to determine general directions in the labor market; it also can be used to determine the volume of hiring, wages offered, and industries actively engaged in hiring in some occupations. The primary users of this information are CETA, WIN, Job Service, Vocational Rehabilitation, and Vocational Education planners and placement counselors who are dealing with occupations which are similar in part to the occupations reported by the Employment Service.

Trends found in the relationship of the number of job orders to the number of job applicants over time may parallel the actions of the total labor market and may, therefore, have considerable merit as a proxy for supply/demand analysis. However, users of this proxy should consider the following:

- In some rural areas the Employment Service may have relatively high penetration into the local labor market and job order/job applicant information for these areas could be representative of the total labor market. Employment Service penetration may be relatively low in urban areas and the information is not as representative of the general labor market.

An increasing number of applicants to the number of job orders may indicate a general labor market-wide excess supply in that occupation. If the number of applicants to the number of job orders remains relatively constant, this may indicate a long-term stability in the occupation. An increasing trend of more job orders being received than applicants registering for work in an occupation may indicate a general labor market shortage of trained workers

The State of Oregon, Department of Human Resources, Employment Division has initiated Project FOCUS, which tracks job orders and applicants by occupation over time.

5.4.3 HARD-TO-FILL JOB OPENINGS

One of the available Employment Service statistics on "hard-to-fill" openings is a ratio of openings unfilled 30 days or more to total openings available during the period. ESARS Table 96, Applicants and Nonagricultural Job Openings by Occupation, lists openings by occupation that have been on hand with the Employment Service for 30 days or more and are still open at the end of the reporting period.

When the ratio is high (25 percent of total are still unfilled at the end of the period), the occupation may have unpleasant working conditions, offer low pay and low status; or there is an insufficient supply of workers to fill the available jobs. When the ratio is low, the occupation may be desirable or there may be a sufficient supply of qualified workers

Users of this proxy in supply/demand analysis should be careful to recognize that many of the openings reported in ESARS Table 96 may be for low-pay, low status jobs, or for jobs listed by employers only to comply with Federal regulations. Some employers may continually list openings in high turnover occupations in excess of their needs in order to get a constant flow of job applicants.

5.4.4 EMERGING OCCUPATIONS

Emerging occupations are those occupations that are relatively new in an industry or in the occupational structure in general, and are appearing in sufficient number to be considered significant in the labor market. Potential indicators of emerging occupations include:

- A significant increase in employment in an occupation between two OES Surveys
- An employer listing an occupation on an OES Survey that had not been previously listed
- Technical publications from the Bureau of Labor Statistics, such as the Occupational Outlook Quarterly, that discuss an emerging occupation

By definition, an emerging occupation will have short-term demand that exceeds supply. Planning training programs to meet anticipated demand in an emerging occupation may prove difficult because of the lack of experience with the skill, structure, and scope of the occupation within industries.

5.4.5 INDUSTRY GROWTH PATTERNS

Much of the employment information collected nationally uses an industry classification structure, usually the Standard Industrial Classification (SIC). As a result, a great deal of information is known about the growth and/or decline of specific industries. Federal, State, and local commerce and economic growth agencies and industry associations analyze in detail the growth patterns of industry. Publications from these agencies may provide indicators of which industries may be expanding or contracting in a given area. As a proxy for supply/demand analysis, the industry-occupation matrix from the OES program (or industry staffing patterns, where available) could be applied to these industries to provide an indicator of which occupations are likely to be especially affected. Occupations whose employment is concentrated in a few industries may warrant special attention (See Section 5.2.4).

Expanding industries are likely to produce jobs for which there may be insufficient supply in the labor market. However, it should be noted that industries that require extensive capital investment to expand are likely to have considered the availability of skilled workers before committing to the capital investment.

Industries that are contracting in size may generate the most difficult occupational supply/demand relationships in a local labor market. Reduced occupational demand may result in a rise in unemployment in these occupations employed in that industry. Situations where rapid industrial contraction occurs may result in students participating in training programs for which there is little opportunity for employment upon graduation.

Industry growth patterns provide a useful proxy for supply/demand analysis for occupations found in industries undergoing particularly rapid growth or contraction, as the long-term demand projections will not adequately reflect these short-term fluctuations in the local supply/demand situation.

5.4.6 EMPLOYMENT SERVICE POTENTIAL AND EMPLOYER INFORMATION SYSTEM

The Employment Service Potential (ESP) and Employment Information System (EIS) are programs that serve to measure the Employment Service penetration of job placement in a labor market. Since only a few State Employment Security Agencies have implemented an ESP or EIS program, their use as a proxy is very limited. Also confidentiality factors in those States producing ESP/EIS information may limit their use outside the agency.

Although there are differences between ESP and EIS, those differences do not affect this discussion. ESP/EIS provides information on the total number of hiring actions taking place within the State for which the Employment Service may have a reasonable opportunity of obtaining a job order from the employer and to which the Employment Service would refer the successful job applicant. ESP/EIS exclude hires in which the Employment Service is precluded from participating, such as those made through union hiring halls, government entities, rehires, or other restricted placements.

The ESP and EIS programs are intended to assist the Employment Service in increasing its success as an intermediary in job placement services. In effect, they provide a potential placement target for the Employment Service (See the discussion of historical placement rates as a proxy for supply/demand analysis in Section 5.4.1). ESP and EIS program data may provide trends in labor turnover and hiring rates by industry, geographic areas, and, in some instances where allowed by law, company name, but not occupations.

HOW TO USE MICRO-OIS/CIDS IN THE OCCUPATIONAL PLANNING PROCESS

Demand File is by OES code = 00000000
Supply File is by CIP code = 00.0000
Analysis File is by DOT code = 000.000-000
Characteristics File is by SOC code = 0000

STEP ONE	PATH	
Use Units of Analysis (clusters) as well as other community sources to get initial occupational list	1. Boot up Micro-OIS to Main Menu	→ get Utility sub-menu
	2. Get list of OES occupational titles by Cluster (CLUS)	→ print out
	3. Analyze list	→ compare to other sources
STEP TWO		
Use Demand reports to get level of demand for occupations	4. Use Direct Search to get Demand Production report for clusters of interest	→ select occupational title of interest
	5. Analyze list	→ compare
STEP THREE		
Get characteristics of occupational titles of interest	6a. Use Direct Search to find CIDS code	→ call up Title search, type in occupational title abbreviation
	6b. or use CIDS/CLUS crosswalk	
	7. Identify CIDS code no. (4-digit)	→ confirm that CIDS code is in cluster you want
	8. Return to Main Menu to get Characteristics of occupational title	→ call up CIDS file from Selected Search using 4-digit code
	9. Analyze occupational characteristics	→ compare occupations using GED, SVP, PD, ENV & TEMP

STEP FOUR	PATH	
Get complete description of occupations of interest	10a. Use Selected Search to call up CIDS file	→ use direct acces to CIDS narrative option or continue on Path 8 above
	10b. Use Direct Search to call up Production report of CIDS narrative	
STEP FIVE	11. Analyze occupational requirements, outlook & preparation	→ compare
Use Analysis reports to get partial level of competition in marketplace and wage levels	12. Use Direct Search to get Production Reports	
	13. May also access CIDS files as above	→ use Title search for CIDS/CLUS crosswalk
STEP SIX		
Use Supply reports to find available training and level of activity	14. Use Direct Search to get Production Reports	
	15. May also access CIDS files as above	→ use Title search or CIDS/CLUS crosswalk

TABLE 1
COMMUNITY SOURCES

LOCAL

State Advisory Council for Vocational Education (SACVE) Annual Report
Commission on Manpower & Full Employment

Accountability Report
Office of the State Director for Vocational Education

Annual Planning Information
Research & Statistics, Department of Labor & Industrial Relations

Employment Outlook for Industries & Occupations
Research & Statistics, Department of Labor & Industrial Relations

Career Kokua (HCIDS)
Department of Labor & Industrial Relations

HOEPS Units of Analysis and Reports
Hawaii State Occupational Information Coordinating Committee

Department of Planning & Economic Development Annual Report

Private Sector Reports
--Banks
--Tax Foundation
--Chamber of Commerce

Newspapers

NATIONAL

Occupational Outlook Handbook

Occupational Outlook Quarterly

NOICC Units of Analysis & Vocational Preparation Occupations

Daily Newspapers (Wall Street Journal, etc.)

Weekly Magazines

Monthly Magazines (Forbes, Business Week, Fortune)

TABLE 2
UNITS OF ANALYSIS

LISTING OF CLUSTER CODES AND TITLES

CLUSTER #	CLUSTER TITLES
000	ADMINISTRATIVE & PROFESSIONAL
009	ALL OTHER
010	NEW AND EMERGING
015	AQUACULTURE
020	AUDIO VIDEO
025	BUSINESS MACHINES
030	COMMERCIAL PHOTOGRAPHY
035	COMPUTER ELECTRONICS
040	COMPUTER SERVICING
045	DIETICIAN AIDING
050	EMERGENCY MEDICAL
055	PHYSICAL THERAPY
100	AGRICULTURE
110	AGRICULTURAL PRODUCTION
130	HORTICULTURE
200	BUSINESS,OFFICE,MARKETING & DISTRIBUTION
210	ACCOUNTING
215	CK MANAGEMENT CLUSTER
220	BANKING & FINANCE
230	DATA/COMPUTER MANAGEMENT
240	SECRETARIAL & STENOGRAPHY
250	GENERAL OFFICE TYPING
260	MARKETING & DISTRIBUTION
300	PERSONAL AND PUBLIC SERVICE
310	PERSONAL SERVICES
320	PROTECTIVE SERVICES
330	HUMAN SERVICES
340	LEGAL SERVICES
350	LIBRARY SERVICES
360	RECREATION SERVICES
370	DOMICILE MANAGEMENT SERVICES
380	CK SOCIAL SCIENTISTS
390	CK ART AND DESIGN
400	HEALTH
410	DENTAL
420	MEDICAL ASSISTING
430	MEDICAL LAB
440	NURSING
450	OCCUPATIONAL THERAPY
460	RADIOGRAPHY
470	RESPIRATORY THERAPY
500	FOOD SERVICE
510	BAKING SERVICES
520	FOOD MANAGEMENT & PREPARATION
530	FOOD SERVING

LISTING OF CLUSTER CODES AND TITLES (CON'T)

CLUSTER NO	CLUSTER TITLES
600	ENGINEERING RELATED TECHNOLOGIES
610	ELECTRONICS
620	ENGINEERING RELATED
630	FLUIDS TECHNOLOGY
640	QUALITY CONTROL AND SAFETY
650	CK PLANNERS & ARCHITECTS
660	CK PHYSICAL SCIENTISTS
699	CK OTHER TECHNICIANS
700	BUILDING TRADES
705	BRICK MASONRY
710	BUILDING MAINTENANCE
715	CARPENTRY
717	CEMENT MASONRY
720	DRYWALL
725	ELECTRICITY
730	FLOOR COVERING
735	GLAZING
740	INSULATION
745	PAINTING
750	PLASTERING
755	ROOFING
760	PLUMBING
765	GENERAL CONSTRUCTION
800	MECHANICS AND REPAIRERS
810	AIRCRAFT
820	AUTO BODY
830	AUTO MECHANICS
840	DIESEL
850	HEATING, AIR CONDITIONING, REFRIGERATION
860	HEAVY EQUIPMENT
899	GENERAL INDUSTRIAL REPAIRERS
900	PRECISION PRODUCTION
910	APPAREL DESIGN & CONSTRUCITON
920	DRAFTING, GENERAL
930	GRAPHICS
940	MACHINE TOOLS
950	METAL FABRICATION
960	MILLWORK
970	SHEET METAL
980	WELDING

TABLE 3
DEMAND REPORT

04/02/85
HAWAII OCCUPATIONAL INFORMATION SYSTEM
S U P P L Y - D E M A N D R E P O R T

STATEWIDE
CLUSTER TITLE ACCOUNTING
REPORT PERIOD: 1983 DEMAND PROJECTIONS: 1980-1990 CLUSTER CODE 210

- DISCIPLINE - TITLE	CODE	BASEYR EMPLOY	PROJ. EMPLOY	AVG GROWTH	AVG REPLAC	AVG OPEN	PUBLIC SECOND	PUBLIC POSSEC	PRIVATE POSSEC	JTPA	JOB CORPS	APPREN TICE	MILI TARY
DEMAND:													
ACCOUNTANTS/AUDITORS	10240201	3240	4120	88	102	190							
TAX EXAM/COLLECTORS	10240203	130	120	0	3	3							
TAX PREPARER	10240204	230	280	5	6	11							
BOOKKEEPING/BILLING MACHINE	40040201	640	820	19	17	36							
PROOF MACHINE OPERATORS	40040202	140	160	3	3	6							
BOOKKEEPERS, HAND	40060603	3460	4220	75	98	173							
CHECKING CLERKS	40062209	161	210	4	4	8							
PAYROLL/TIMEKEEPING CLERKS	40064000	780	910	11	23	34							
STATISTICAL CLERKS	40065211	230	260	3	5	8							
COIN MACHINE OPERATORS/CURRE	40066803	10	20	0	0	0							
TOTALS		9021	11120	208	261	469							
SUPPLY:													
ACCOUNTING, BOOKKEEPING	07.0101						3076	190					
TOTALS							3076	190					

TABLE 4
CHARACTERISTICS REPORT AND DEFINITIONS

Example:

	U/A	CK	SOC		GED	SVP	PD	ENV	D	F	I	J	M	P	R	S	T	V
00321	520			FOOD MANAGEMENT & PREPAR														
00316	520	4346	7664	FOOD PROCESS WORKER	212	3	M34	I	N	N	N	N	N	N	Y	N	Y	N
00317	520	7824	5214	CHEFS/COOKS	433	7	M46	I2345	N	N	N	Y	N	N	N	N	Y	Y
00318	520	7826	5215	SHORT ORDER COOK	323	4	L45	I3467	N	N	N	N	N	Y	Y	N	N	N
00319	520	7852	5212	BARTENDERS	322	3	L456	I	N	N	N	N	Y	Y	N	N	N	N
00320	520	7884	5219	KITCHEN HELP	211	2	M4	I346	N	N	N	N	N	N	Y	N	N	N

GED: General Educational Development

GED embraces those aspects of education (formal and informal) which contribute to the worker's (a) reasoning development and ability to follow instructions and (b) acquisition of "tool" knowledge such as language and mathematical skills. This is education of a general nature which does not have a recognized, fairly specific occupational objective. Ordinarily, such education is obtained in elementary school, high school, or college. However, it derives also from experience and self-study.

Level	Reasoning	Math	Language
6	apply wide range of logical and scientific deduction and induction	advanced calculus and operations, experimental design	read abstract or complicated material, write novels or critiques, converse on theory and debate
.			
.			
.			
1	common sense understanding	add, subtract 2-digit numbers	recognize 2,500 words, print simple sentences

SVP: Specific Vocational Preparation

SVP is the amount of time required to learn the techniques, acquire the information, and develop the facility needed for average performance in a specific job-worker situation.

This training may be acquired in a school, work, military, institutional, or vocational environment. It does not include orientation training required of a fully qualified worker to become accustomed to the special conditions of any new job.

Level								
1	. . .	4	5	6	7	8	9	
short	demo	3-6 months	6-12 months	12-24 months	24-48 months	4-10 years	over 10 years	

PD: Physical Demands

1. S = sedentary
   L = light
   M = medium
   H = heavy
   VH = very heavy
2 = climbing/balancing
3 = stooping/kneeling
4 = reaching/handling
5 = talking/hearing
6 = seeing

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ENV: Environmental Conditions

1. I = inside O = outside B = both
2. extreme cold
3. extreme heat
4. wet or humid
5. noise or vibration
6. hazards
7. air pollution: fumes, odors, dust, mist, gas

Temperaments

D: DECISION-MAKING means the occupation requires you to take a lot of responsibility in directing, controlling, or planning.
F: CREATIVITY means using feelings, ideas and facts imaginatively.
I: INFLUENCING other people as to their opinions, attitudes or judgments.
J: JUDGMENT-MAKING means using your senses or knowledge to understand or evaluate situations or people.
M: MEASURING means using data or other facts to evaluate or decide.
P: PEOPLE means working with others beyond just talking to them, such as cooperating or helping.
R: ROUTINE or repetitious work.
S: STRESS on the job means either unusual situations or a fast pace of work.
T: TOLERANCE means using precise standards or measures.
V: VARIETY means changing work tasks easily from one skill to another.

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TABLE 5: AGGREGATE RANK ORDER

REPORT NO. 01 RANKING BY "PROJ": HI00 (NOT FOR PUBLICATION) 05/18/84 PAGE 1

		SEPR	GRRATE	•1980•	•1990•	GROWTH	ANNGRW	ANNSEP	ANNOPN	
20061699	ALL OTHER MANAGERS	0335	000239	23321	28904	5583	558	875	1433	HI00
70020600	JANITORS,PORTERS,& CLEANERS	0415	000243	17125	21284	4159	416	797	1213	HI00
30001802	SALES CLERKS	0320	000265	16574	20959	4385	439	601	1040	HI00
70041602	WAITERS OR WAITRESSES	0252	000231	12497	15390	2893	289	351	640	HI00
40066811	GENERAL CLERKS,OFFICE	0275	000211	11925	14438	2513	251	362	613	HI00
40020200	SECRETARIES	0289	000270	9384	11918	2534	253	308	561	HI00
10203002	PRESCH. &/OR ELEM. SCH. TEACHERS	0277	000251	8256	10325	2069	207	257	464	HI00
80002899	ALL OTHER LABORERS & UNSKLD WKRS	0219	000071	9056	9696	640	64	205	269	HI00
40060800	CASHIERS	0284	000288	6721	8659	1938	194	218	412	HI00
30001808	SALES REPS.,TECHNICAL	0277	000283	6277	8052	1775	178	198	376	HI00
70041802	KITCHEN HELPERS	0316	000219	5918	7215	1297	130	207	337	HI00
10205000	TEACHERS,SECONDARY	0246	000054	5981	6304	323	32	151	183	HI00
70100601	GUARDS & DOORKEEPERS	0349	000344	4300	5778	1478	148	176	324	HI00
40060601	ACCOUNTING CLERKS	0256	000194	4822	5758	936	94	135	229	HI00
70041804	FD PREP & SERV WKRS,FAST FD REST	0316	000248	4453	5557	1104	110	158	268	HI00
10100800	NURSES,PROFESSIONAL	0258	000324	4017	5320	1303	130	120	250	HI00
10243899	ALL OTHER PROFESSIONAL WORKERS	0176	000210	4281	5182	901	90	83	173	HI00
40066898	ALL OTHER OFFICE CLERICAL WKRS	0275	000176	4301	5057	756	76	129	205	HI00
20061612	MANAGERS,STORE	0335	000281	3846	4926	1080	108	147	255	HI00
40020600	TYPISTS	0293	000191	3996	4759	763	76	128	204	HI00
62002201	TRUCK DRIVERS	0186	000083	4265	4617	352	35	83	118	HI00
63000000	ALL OTHER OPS & SEMISKILLED WKRS	0276	000177	3906	4597	691	69	117	186	HI00
50020201	CARPENTERS	0238	000031-	4621	4471	150-	14-	108	94	HI00
62000801	DELIVERY & ROUTE WORKERS	0181	000268	3443	4367	924	92	71	163	HI00
40065404	STOCK CLERKS,STOCKRM,WAREHS,ETC	0243	000223	3518	4304	786	79	95	174	HI00
40060603	BOOKKEEPERS,HAND	0256	000215	3463	4206	743	74	98	172	HI00
10240201	ACCOUNTANTS & AUDITORS	0275	000264	3236	4089	853	85	101	186	HI00
50040003	SUPERVISORS,NONWORKING	0244	000139	3587	4087	500	50	94	144	HI00
80001401	GARDENERS & GROUNDSKEEPERS	0277	000288	3171	4084	913	91	100	191	HI00
70200099	ALL OTHER SERVICE WORKERS	0097	000293	3129	4045	916	92	35	127	HI00
50081001	AUTOMOTIVE MECHANICS	0184	000176	3271	3848	577	58	65	123	HI00
50144821	MAINTENANCE REPAIRERS,GEN UTIL	0182	000234	3023	3731	708	71	61	132	HI00
70040802	COOKS,SHORT ORDER/SPEC FAST FD	0338	000242	2989	3713	724	72	113	185	HI00
70040803	COOKS,RESTAURANT	0338	000234	2976	3673	697	70	112	182	HI00
20061400	MANAGERS,REST'RANT,COFFEE SH,ETC	0289	000245	2774	3455	681	68	90	158	HI00
70041898	COUNTER ATTNS, LUNCHRM, COF SH.	0277	000230	2747	3380	633	63	85	148	HI00
70061010	NURSES AIDES/ORDERLIES	0321	000288	2590	3337	747	75	95	170	HI00
30001899	ALL OTHER SALES WORKERS	0320	000295	2478	3210	732	73	91	164	HI00
70040600	DINING RM ATTNS,BAR HELPERS,ETC	0129	000230	2561	3149	588	59	37	96	HI00
40060203	TELLERS	0314	000317	2316	3050	734	73	84	157	HI00
10201000	TEACHERS,ADULT EDUCATION	0400	000339	2253	3017	764	76	105	181	HI00
70040400	BARTENDERS	0201	000235	2223	2746	523	52	50	102	HI00
80002823	HELPERS,TRADES	0218	000116	2277	2542	265	27	53	80	HI00
80002003	STOCK CLERKS,SALES FLOOR	0123	000217	2079	2530	451	45	28	73	HI00
50021401	ELECTRICIANS	0186	000030	2440	2512	72	7	46	53	HI00
30001807	SALES REPS.,NONTECHNICAL	0277	000250	2002	2502	500	50	62	112	HI00
50023203	PLUMBERS &/OR PIPEFITTERS	0193	000015	2250	2283	33	3	44	47	HI00
40061200	CLERICAL SUPERVISORS	0217	000267	1786	2262	476	48	44	92	HI00
40064802	RECEPTIONISTS	0300	000302	1716	2235	519	52	59	111	HI00
62000401	BUS DRIVERS	0277	000364	1524	2078	554	55	50	105	HI00
10121010	LICENSED PRACTICAL NURSES	0325	000241	1672	2075	403	40	61	101	HI00
61082605	FUEL PUMP ATTENDANTS,LUBRICATORS	0106	000143-	2359	2020	339-	33-	23	10-	HI00
70200001	SUPERVISORS,NONWORKING,SERVICE	0244	000227	1545	1895	350	35	42	77	HI00
70041805	PANTRY,SANDWICH,&/OR COFF MAKERS	0316	000251	1508	1886	378	38	54	92	HI00
70101006	POLICE PATROLMEN/WOMEN	0097	000253	1479	1853	374	37	16	53	HI00

TABLE 6
ANALYSIS REPORT

04/02/85
HAWAII OCCUPATIONAL INFORMATION SYSTEM
A N A L Y S I S I N F O R M A T I O N

CLUSTER TITLE ACCOUNTING
STATEWIDE

CLUSTER CODE 210

CLUS #	CODE	TITLE	TOTAL UI:CLM	TOTAL ES:OPN	TOTAL ES:APS	RATIO OPN/APS	HOURLY WAGE	CO
210	210.382-010	AUDIT CLERK	4	12	36	0.3	4.62	
210	210.382-014	BOOKKEEPER I	66	116	315	0.4	5.42	
210	210.382-018	BOOKKEEPER II	20	33	110	0.3	N.A.	
210	210.382-022	BOOKKEEPING-MACHINE	0	1	7	0.1	4.59	
210	215.482-010	PAYROLL CLERK	10	10	47	0.2	6.00	
210	216.382-034	COST CLERK	2	3	6	0.5	5.57	
210	216.482-010	ACCOUNTING CLERK	120	199	563	0.4	5.42	
210	241.357-010	COLLECTION CLERK	12	18	26	0.7	N.A.	

TABLE 7
SUPPLY REPORT

04/02/85
HAWAII OCCUPATIONAL INFORMATION SYSTEM
S U P P L Y - D E M A N D R E P O R T

STATEWIDE
CLUSTER TITLE ACCOUNTING
REPORT PERIOD: 1983 DEMAND PROJECTIONS: 1980-1990 CLUSTER CODE 210

- DISCIPLINE - TITLE	CODE	BASEYR EMPLOY	PROJ. EMPLOY	AVG GROWTH	AVG REPLAC	AVG OPEN	PUBLIC SECOND	PUBLIC POSSEC	PRIVATE POSSEC	JTPA	JOB CORPS	APPREN TICE	MILI TARY
DEMAND:													
ACCOUNTANTS/AUDITORS	10240201	3240	4120	88	102	190							
TAX EXAM/COLLECTORS	10240203	130	120	0	3	3							
TAX PREPARER	10240204	230	280	5	6	11							
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STATISTICAL CLERKS	40065211	230	260	3	5	8							
COIN MACHINE OPERATORS/CURRE	40066803	10	20	0	0	0							
TOTALS		9021	11120	208	261	469							
SUPPLY:													
ACCOUNTING, BOOKKEEPING	07.0101						3076	190					
TOTALS							3076	190					